

Having described the invention, what is claimed is:

- 1           1. A ball ramp actuator for use as a locking mechanism, the actuator comprising:  
2           a first cam plate having at least one groove providing a non-circumferential ball  
3           ramp;  
4           a second cam plate rotatable with respect to the first cam plate, and having at least  
5           one groove providing a non-circumferential ball ramp, the ball ramp of the second cam  
6           plate intersecting with the ball ramp of the first cam plate when viewed axially;  
7           a ball positioned between the first and second cam plates, in the grooves of the first  
8           and second cam plates; and  
9           biasing means for biasing the ball radially to ensure that the ball follows the non-  
10          circumferential ball ramps of both cam plates in response to relative rotation of the two  
11          cam plates.
- 1           2. A ball ramp actuator according to claim 1, wherein the grooves become  
2           shallower as they extend radially outward such that radially outward movement of the ball  
3           spreads the cam plates apart.
- 1           3. A ball ramp actuator according to claim 1, wherein the biasing means  
2           comprises a ball retainer in contact with the ball and having resiliently deformable portions  
3           that serve as integral springs.
- 1           4. A ball ramp actuator according to claim 1, wherein the biasing means  
2           comprises a ball retainer with a pocket within which the ball is located.

1           5. A ball ramp actuator according to claim 1, wherein the biasing means  
2 comprises a ball retainer with a flexible arm in contact with the ball.

1           6. A ball ramp actuator according to claim 1, wherein the biasing means  
2 comprises a ball retainer with a concave surface in contact with the ball such that the ball is  
3 centered with respect to the ball retainer.

1           7. A ball ramp actuator according to claim 1, wherein the biasing means  
2 comprises a ball retainer made of an elastically deformable polymer.

1           8. A ball ramp actuator according to claim 1, wherein the number of balls is three.

1           9. A ball ramp actuator according to claim 1, wherein the number of balls is more  
2 than three.

1           10. A ball ramp actuator according to claim 1, wherein the grooves include at least  
2 one spherical recess to provide a detent for maintaining the ball in a locked or unlocked  
3 position.

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